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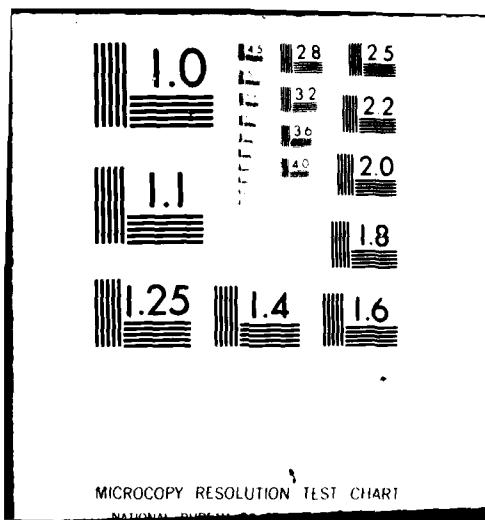
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## STUDENT RESEARCH REPORT

SOVIET RAILROAD TROOPS:  
An Updated Review

MAJ Kenneth M. Keltner  
1980

GARMISCH, GERMANY

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February 1980

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FOREWORD

This research project represents fulfillment of a student requirement for successful completion of the overseas phase of training of the Department of the Army's Foreign Area Officer Program (Russian).

Only unclassified sources are used in producing the research paper. The opinions, value judgements and conclusions expressed are those of the author and in no way reflect official policy of the United States Government, Department of Defense, Department of the Army, the US Army Intelligence and Security Command, or the Russian Institute. The completed paper is not to be reproduced in whole or in part without permission of the Commander, US Army Russian Institute, APO New York 09053.

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SUMMARY

This paper provides an updated review of Soviet railroad troops. Written primarily for the benefit of personnel working in the field of transportation, the author shows that in terms of historical development, education and training of personnel, and current utilization of railroad troops and equipment, the Soviets possess an effective logistics capability that can provide efficient support of combat elements.

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## PREFACE

The recent Soviet invasion of Afghanistan and increased naval activities in the Indian Ocean have provided Western military analysts with an invaluable opportunity to review current Soviet military operations. Among this interested group, logistics analysts should certainly be among the most active since logistics operations on a broad scale are seldom discussed in open Soviet sources. While the data obtained from observation of current Soviet logistics support operations will be significant, a certain perspective must be maintained by these analysts in order to develop a more complete evaluation of Soviet logistics capabilities.

In the Afghan operation, logistics resupply has been accomplished by use of motor transport and air transport assets. Based on reports carried by various news services, the major effort is being conducted with aircraft. Rail assets are not being used due to a lack of rail connections between the two nations. Soviet naval operations in the Indian Ocean have been, of course, resupplied by marine cargo assets and in some cases, helicopters for movement of high priority items between vessels.<sup>1</sup>

In each case, the assumption can be made that rail transport played a significant effort within the Soviet Union in movement of supplies to the particular naval bases and staging areas from which current operational elements were launched. It is the actual operations themselves where rail has no immediate impact that will be studied by these analysts, and this could create problems in future logistics evaluations.

At this point maintenance of a proper perspective must be exercised. If future studies focus only on Soviet logistics operations in support of these specific cases, possibility for error will be reduced, but if these latest logistics efforts are utilized as the basis for a totally new evaluation of the Soviet logistics system as a whole, significant misunderstanding will arise if rail capabilities are degraded or overlooked.

Rail resupply operations will continue to play a significant role in any Soviet military action in Europe. To ensure that Soviet rail capabilities are not lost in the evaluation of obvious Soviet improvements in resupply by air and motor transport modes, an updated look at Soviet railroad troops and their capabilities is needed. This paper will, using open Soviet sources and augmentation by Western data, provide that update.

## INTRODUCTION

During any general discussion concerning Soviet military capabilities in the context of a European conflict, the "short war philosophy" is almost certain to be introduced. The concept is normally presented and supported in the following manner:

While the Soviets have a sizeable superiority in divisions, tanks, and artillery, the austere Soviet logistic system is suitable only for supporting a short war. In fact, the logistic capability to support Soviet combat forces in even a short war has been assessed by some observers as marginal. Among the potential problems cited have been the Soviet reliance on logistical personnel and vehicles mobilized from the civilian economy, the difficulties in maintaining open lines of communication (LOCs) from the USSR, the high rate of combat equipment and troops to support elements in Soviet divisions, and an apparent rigid assumption on the part of the Soviet planners that a future war in Europe, nuclear or conventional, will be quickly concluded.<sup>2</sup>

The Soviets appear to be well aware of these logistical problems and have devoted more attention in recent years to the questions of logistics support and strategic airlift.<sup>3</sup>

Resupply efforts during the Middle East and African conflicts of the 1970s demonstrated that the Soviets now have a strategic airlift capability. The Afghan operation has demonstrated more complex airlift operations plus improved capability of motor transport assets. It should not be assumed, however, that the reliance on airlift or the success of that particular mode can be guaranteed in a European conflict given the modern air forces of the western allies. The very magnitude of a European war will require utilization of all Soviet modes of transportation, and in that case, rail transport will play a large role in the Soviet logistics effort.

Prior to discussion about the railroad troops and those factors which support continued use of rail transport in future conflicts, it should be pointed out that the amount of data concerning Soviet support troops provided in open sources is limited. Available data concerning Soviet railroad troops, their importance in the overall logistics effort and plans for their specific utilization in conflict is extremely limited. The following statement provides one possible reason for the scarcity of information:

In 1975 the Secretary of Defense of the United States noted ... that there probably were additional personnel in supporting Soviet services for which no estimate of numbers had been made ... units of rail and road construction troops, now included among components of "special troops" were not formed until the late 1950s, after forced labor camps had been reduced in size. A number of Senior Soviet officers who had been in charge of these labor camps were transferred to key positions in the newly established construction troops. These matters are not discussed in Soviet publications and, in fact, appear to be concealed deliberately.<sup>4</sup>

In evaluating such a limited amount of material, as much attention has been paid to those things left unsaid as to the information actually provided. The analysis contained in this paper will be extended to either fill in the blanks

or go beyond the very basic data contained in those sources that are devoted to discussion of Soviet railroad troops.

## FACTORS SUPPORTING RAILROAD USAGE

The assumption that rail transport will continue to play a significant role in any future European conflict is based upon several factors.

### Geography

The physical location of the Soviet Union to the potential battle area naturally supports reliance on land transportation for movement of supplies in large quantities. Sea routes are too lengthy and subject to interdiction by opposing naval forces in specific areas such as the Bosphorus and the Dardanelles. Inland water routes linking the Soviet Union and Eastern Europe are not available for support of such a massive resupply effort. Air transport assets are available in large numbers, especially in the event of augmentation by Aeroflot, the large Soviet civilian airline, but the assumption must be made that these assets would be utilized for movement of troops and high priority items. When a land mode of transportation is selected, motor transport cannot compete with rail capabilities in terms of efficient movement of large tonnages. This is especially true in the Soviet Union because of its general under-development of a highway system, and its continued reliance on smaller, general purpose cargo vehicles.<sup>5</sup>

### Existing Soviet Transport System

Rail transport is the backbone of the entire transportation system of the Soviet Union. In the mid-1970s, Soviet railroads carried 62% of all freight traffic and 42% of all passenger traffic.<sup>6</sup> To further underscore the capabilities of the Soviet rail organization which is established along the lines of a paramilitary system, the rail network now carries more than half of the world's railroad freight on a little more than 10% of the world's railroad trackage.<sup>7</sup> The Soviets are able to achieve this performance by operating trains at densities unheard of on other European rail systems, and this ability would provide an enormous freight movement capacity to the western borders of the country.<sup>8</sup> Soviet utilization of their rail system to support military action has already been utilized in the past:

During the first five months of the German invasion of Russia in 1941, eighteen fresh Soviet divisions were redeployed from the Far East to the Moscow area ... And during the four months that preceded the Soviet invasion of Manchuria in August 1945, a total of 750,000 personnel, organized in thirty divisions and nine separate brigades, were transferred from the European theater to the Far East.<sup>9</sup>

This factor gains significance if, as some military and political analysts believe, the Chinese react to Soviet military action in Europe by opening a second front against the Soviet Union. Present Soviet troop levels along the Chinese border are extensive, so supplies rather than personnel would require transportation. Possession of movement capability is a prime factor, and it has already been utilized in actual conditions. Further improvements have been made in this particular area and will be discussed in a later section of the paper.

### Scarcity of the Rail System

The vast size of Soviet ground and air forces that would participate in a European conflict would force the NATO allies to commit maximum aircraft to operations over the actual combat area and adjacent rear areas. It is unlikely that NATO air assets would be available for deep strikes against Soviet territory. If such missions were assigned, Soviet air defenses appear to be of sufficient capability and strength to prevent serious disruption of rail lines of communication. Rail transport operating under relatively secure skies would be able to move large amounts of material on an almost continuous basis.

### Problem Areas

In discussing the above factors, the suitability of Soviet rail transport to support engaged combat forces has been underscored, but certain problems do exist if rail transport is used.

The Soviet Union uses a standard broad gauge rail system that is not compatible with other European systems. This has created problems in cargo transshipment between the Soviet Union and Warsaw Pact countries. At large fixed border facilities entire cars are lifted off the rails and wheel sets are interchanged for the appropriate track gauge. This process is more efficient than total offload and reload of cargo into different rail cars, but it still causes a delay of train movement for several hours. A western railroad expert observed one facility where a 14-car passenger train was lifted in a single operation for exchange of wheel sets; the time required for the exchange was about 90 minutes.<sup>10</sup> An additional solution to this problem has entailed construction of two broad gauge rail lines direct from the Soviet Union to Chop, Czechoslovakia (80 kilometers) and to Katowice, Poland (320 kilometers). The Soviets have described these projects as examples of the close economic cooperation between COMECON nations with military value ignored. Despite their omission of potential military benefit, the implication of these lines for support of Soviet military activity cannot be overlooked.<sup>11</sup> It is reasonable to assume that all railroad construction undertaken by the Soviet government is based to as great extent on strategic considerations as it is for normal economic development.

Should the amount of cargo to be moved in support of military action exceed the rail capacities of these two lines or the facilities for interchange of wheel sets be destroyed, transshipment from rail to motor modes would be required. This would further delay movement of cargo and create a bottleneck that would present a lucrative target for nuclear strikes. It would additionally reduce the number of motor transport assets that are normally used by the Soviet forces in their logistics effort.<sup>12</sup> These problems would restrict cargo flow, but the movement effort would not be completely halted. Despite the fact that the Soviet road network is underdeveloped, it is most capable in the western regions of the nation.<sup>13</sup> Therefore, if transshipment could be accomplished close to the borders of the Eastern European countries, vehicles could easily reach their more highly developed road nets and disperse rapidly.

Despite these problem areas, the benefits from use of rail transport in terms of quantity of cargo and efficiency of movement support continued military

reliance on this mode.

### SOVIET RAILROAD TROOPS

Having discussed some general factors that support continued reliance on rail transport for logistics resupply of Soviet forces, attention should be focused on the personnel that operate the rail system during wartime. The system will be only as effective as the personnel who man it, and one analyst believes that it is probable that railway construction units are as technically proficient as any troops in the Soviet Army.<sup>14</sup> This segment will examine railroad troops from their formation in Czarist times until today, to include their education, training, utilization of skills and combat usage.

#### History

The formation of Soviet railway troops dates from October 1918, but the use and importance of railroad troops and railroads dates from the year 1851 when the Moscow to St. Petersburg railroad was opened.<sup>15</sup> In the early 1870s the Czar's government recognised the need for railroad troops to receive special training in construction techniques, and a cadre was formed to organize and conduct this training. The Russo-Turkish War in 1877-78 established the value of these troops as they were utilized to construct a 300 kilometer rail line in support of the war effort. In the post-war period, railway troops were used to construct approximately 1,500 kilometers of new track, primarily in the Asian portion of the nation. The use of military personnel to accomplish civil works projects began a tradition that has remained to this day.

Prior to the Russo-Japanese War, railway troops were placed within the Directorate of Military Communications under the control of the Russian General Staff. This action provided for a more effective use of railroad troops and their equipment during the Russo-Japanese conflict. Charged with the operation and defense of the rail arteries, they moved men and material to the front and returned carrying Russian casualties. Railway troops also were assigned other tasks during this period; they built numerous narrow gauge rail lines and roads to support motor transport operations. Placement of railway troops under the General Staff resulted in a qualitative increase in cadre proficiency through establishment of education institutions designed for specialized training in rail operating procedures and rail construction methods.

Railway troops increased in number and in mission responsibilities in their participation in World War I. Railroad brigades supported each army front and were assigned to build, maintain and defend rail lines. During World War I the Russians utilized armored trains that were manned by railway troops; during the same period a mobile maintenance capability was developed to maintain forward operations at peak capacity.

The importance of railroads and railway troops was immediately recognised during the Great October Revolution. Railroad troops were included in the organization of the Red Army with a special directorate for railway troops formed for command and control purposes.

During the period of civil war that followed the Revolution, rail repair capability was needed in every sector of the country. Railway troops repaired

bridges, rail lines, rolling stock and operated troop and supply trains. For their actions during this critical period, several rail units were presented with the award of the Revolutionary Red Banner.

As a result of the chaos within the Soviet Union from 1918-1921, railroad troops provided an invaluable service to Lenin's government in the operation of armored trains. These armored trains became a symbol of the Soviet determination to succeed, and a popular song of the late 1930s contained the phrase: "We are a peaceful people, but our armored train is on the siding."<sup>16</sup> The importance of these trains to the new nation has been pointed out by a Soviet officer:

The Communist Party and V. I. Lenin himself took measures to provide the Red Army of the young Soviet Republic with weapons and other military equipment that would stand up to the White Guard and the interventionist armies armed to the teeth. The building of armored trains was one such measure. By October 1918 the Red Army had 23 armored trains and a year later 103. Armored trains played a big role in the war against the armies of the foreign interventionists and the internal counter-revolutionaries. Occasionally armored trains, like armored cars and tanks, were a component of the Red Army land forces known as the armored forces.<sup>17</sup>

One of these trains, Armored Train 50-67, is prominently displayed on the grounds of the Central Museum of Armed Forces in Moscow. It symbolizes the importance of the armored train in the development of the Soviet Union, but it also symbolizes the efforts of the railway troops who restored 22,000 kilometers of track, rebuilt 3,000 bridges and repaired 16,500 railcars in the same period, 1918-1921.<sup>18</sup>

Between the Civil War and World War II, railway troops were dispatched throughout the Soviet Union to continue restoration work on the entire rail system. During this period, the railroad network was the link that held the young nation together. The importance of the rail system in Stalin's program to develop "socialism in one country" with its related development of heavy industry was critical. Only the railroad connected the cities with developing industrial sites and raw materials regions, and the railway troops were responsible for the maintenance and defense of these vital links. Because of its importance to the nation, the leadership of both civilian and military railroad elements gained great power and influence. During the purges just prior to World War II, the railway system was especially hard hit, a testimony to the influence that the railroad industry as a whole had developed.<sup>19</sup>

In 1941 a reorganization of railway forces was initiated with the goal of developing units with specific capabilities and missions. The Nazi invasion prevented completion of the program, but the effort to specialize railway functions would be completed in the post-war period.

The value of railroad equipment to the Soviet leadership became apparent during the German invasion. The rolling stock and motive power was evacuated as rapidly as possible from the path of the invading armies. Rail units were formed in rear areas to support the expected Soviet counterattack, but the Nazi advance was so rapid that railway troops reverted to their secondary mission and fought as infantry against the invading forces. Several units received distinction for their actions.

During the war, railway troops were primarily tasked with the missions of troop movement, resupply, and restoration and defense of rail lines and bridges. According to Colonel General of Technical Troops, A.M. Kryukov, the accomplishments of railroad troops during World War II were highly significant:

During the Great Patriotic War the Soviet railway troops restored 117,000km of railway lines, including 36,000km on the roads of foreign countries, over 15,000 bridges and pipes, 75,000km of wire communications and dozens of tunnels. The railway-sappers detected and neutralized over two million mines and explosive charges and 60,000 aerial bombs ... For great services to the country 18 units and formations of the railway troops were awarded Orders, several units became Guards units, while a number of formations and units were honored with titles of honor. Nearly 40,000 railway soldiers became bearers of orders and medals, while 29 of them were honored with high titles of Hero of Socialist Labor and Hero of the Soviet Union.<sup>20</sup>

In the period after World War II, the railroad troops again moved into every corner of the Soviet Union to repair, restore, rebuild and construct new facilities. In several instances railway troops had to rebuild rail lines in the far eastern regions of the country where rails and ties had been taken up to provide repair materials for rail lines destroyed in the fighting in European Russia.<sup>21</sup> In the period 1945-1975, railway troops are credited with construction of more than 25,000 kilometers of new rail line plus more than 13,000 structures related to the rail mission. There can be no question that the task of rebuilding and repairing the extensive damage caused by the war was accomplished more rapidly due to the labor pool available from the thousands of inmates of concentration and forced labor camps that existed in post-war Russia. Without the prisoners to perform this labor the restoration of the vital rail network would have taken much longer, and the already depleted Soviet labor force would have been reduced in other critical industrial areas.

One of the primary purposes of this historical review has been to show the continual use of railway troops for civil works projects during peacetime. Begun by the Tsar and continued under the Soviets, the use of railway personnel to accomplish civil tasks has enabled them to maintain a high level of technical proficiency and potential for logistics operations in combat. In addition, training received during military service has ensured that the civilian rail sector can maintain its personnel strength. Finally, the reserve forces possess a pool of trained personnel that can be utilized to expand the railway system in time of war.

#### Formal Officer Education

Currently there are seven military schools devoted to formal instruction of logistics/rear services officers; of these, three schools provide training for officers assigned to railway troop units:

- 1) Vol'sk Higher Military School of the Rear Services named for Lenin's Red Banner Komsomol;
- 2) Leningrad Higher School of Railroad Troops and Military Communications named for M.V. Frunze;

3) Moscow Higher Command School of Road and Engineer Troops.<sup>22</sup>

Information about the Vol'sk Higher Military School is limited, but it appears that the curriculum consists of a general logistics education. This statement is based upon the fact that this institution produces trained officers for all of the rear services.<sup>23</sup>

The military institution providing specific education for officers of the railway troops is the Leningrad Higher School of Railroad Troops and Military Communications. According to an announcement of vacancies in this program, students spend from four to five years in a structured curriculum that will result in award of an engineering degree and the rank of lieutenant.<sup>24</sup>

The Moscow Higher Command School of Road and Engineer Troops offers a four year program which qualifies graduates as engineers in construction of highways and bridges and operation of air, water and rail facilities.<sup>25</sup>

The schools, normally commanded by general officers, follow the standard Soviet pattern of selection by competitive examinations. The expressed Soviet goal in the selection process is to have three applicants for each vacancy.<sup>26</sup>

These schools produce highly qualified officers trained for specific functions. Since the operation of Soviet railway troops encompass areas that are assigned to both transportation and engineering functions, engineering disciplines predominate.<sup>27</sup>

Officers, warrant officers and enlisted personnel who aspire to become officers may participate in off-duty correspondence courses. These correspondence courses are normally offered by the various service academies and are offered in the announcement of vacancies for attendance at service academies.<sup>28</sup>

The keen competition for schooling and the lengthy courses of instruction produce a very qualified officer corps. Although their training is often within a narrow field and provides little latitude for expansion into other areas, the overall duty-related education program appears to produce positive results. At the conclusion of this training the officer is expected to accomplish the following:

...must possess the knowledge of both an engineer and an all-arms commander, because in a combat situation he would frequently have to direct the restoration of a destroyed installation under enemy fire. He must have a good knowledge of the fundamentals of modern battle, of demining and carrying out technical reconnaissance of railway lines, of protection against mass destruction weapons and of the tactical characteristics of material and weaponry. And, finally, he must be able to teach, train and educate his subordinates.<sup>29</sup>

Mission

The mission assigned to the Soviet railroad troops is simple and to the point: "The railway troops, as special troops, are tasked to restore, build and operate railroads in wartime conditions."<sup>30</sup>

This brief mission statement was expanded by the Chief of Railway Troops of the Soviet Army in an interview for a Soviet journal:

Comrade Colonel General, the scientific-technological revolution in warfare has raised anew a question of moving and regrouping forces, their material and technical supply and other problems of support of operations. How has this reflected on the development of the railway troops?

The specifics of modern warfare demand high speed in building and restoring front railroads, their skillful exploitation, reliable protection and erection of obstacles. These missions the railway troops carry out in wartime. In peacetime, besides combat training the railway troops are assigned the missions of carrying out great volumes of work in building and strengthening railways.<sup>31</sup>

This interview makes clear the fact that railway troops possess two distinct missions for war and peacetime, but with the exception of the phrase, "wartime condition", the basic mission is generally the same.

### Training

#### Military Training

Railway construction units have been exercised extensively in recent years with the main focus of their training centered on rapid repair of damaged rail lines and bridges.<sup>32</sup> These exercises have been conducted during combined arms exercises and in "logistics only" exercises of the Soviet Army and in joint operations with other nations of the Warsaw Pact.

The Soviets are particularly proud of a floating railroad bridge that was erected during exercise "Dnepr" in 1967. The capability of the equipment and the personnel who erected it were highly publicized in photographs with the accompanying statement that construction had required only a few hours.

As a result of their responsibility to defend rail lines and their secondary mission to fight as infantry, railroad troop units are constantly exercised, even on some civilian construction projects, with defensive drills designed to repel aggressor forces or saboteurs.<sup>33</sup>

#### Civilian Construction Projects

Fulfillment of their peacetime mission provides the "hands on" training that develops and maintains the level of expertise needed for real combat effectiveness.

The railway troops, too, take the most active part in the work to develop and rebuild the railway network of the USSR. In common with the organizations and enterprises of the Ministry of Transport Construction they are building railroads, railway stations and dwelling houses in the newly populated areas in the north and east of our country ... It is perhaps difficult to mention a single road in our country, in the restoration, building or rebuilding of which the railway troops have not taken part.<sup>34</sup>

### The Baikal-Amur Railroad (BAM)

This project has been separated from the general civilian construction projects involving railway troops because of its unique construction requirements and its enormous scope. The following figures place the project in perspective:

- 1) 300 million cubic feet of rock and soil must be moved;
- 2) total length of track installed is in excess of 3,200 kilometers;
- 3) more than 3,500 bridges and culverts must be built; and
- 4) more than 30 kilometers of tunnels must be built with one tunnel having a distance of 16 kilometers.<sup>35</sup>

This is the most expensive construction project in the history of the Soviet Union; Western estimates of final cost approach \$15 billion.<sup>36</sup> The technology involved is much like that required to build the Alaskan pipeline although the BAM is 2½ times longer. Sections of the rail line pass through areas of extreme cold with temperatures reaching -76 degrees Fahrenheit. In this region track must be laid on top of permafrost; in other zones tracks cross areas prone to earthquakes and landslides.

The technology required for construction of the BAM encompasses new and untested methods that will, if successful, provide added capabilities in rail construction techniques. The railway officers' academy in Leningrad is operating closely with its officer graduates assigned to the BAM to study and incorporate these techniques into its curriculum.<sup>37</sup>

The cooperation between a service academy and officers assigned on the BAM is the first real indication of military interest in the project. The multitude of Soviet articles about the BAM refer only to the vast amounts of raw materials that will become available. Access to these raw materials is, in itself, an item of military significance, but the location of the BAM will provide a strategic line of communications that is farther away from the Chinese border than the Trans-Siberian line. This rail link, less vulnerable to Chinese interdiction, is of great military importance.

A total workforce of 100,000 is involved in the project, and a significant number of them are railway troops.<sup>38</sup> The Soviet Army, as well as being directly involved in the project, also provides a labor pool of civilian workers in the form of discharged soldiers. Many of these newly discharged soldiers were assigned to military duty on the BAM and elected to remain in the civilian workforce. One Soviet writer stated: "Everywhere I met hundreds of lads still wearing military uniforms but without shoulder straps."<sup>39</sup> The same correspondent later said: "We must thank our Armed Forces in whose ranks during their service soldiers became versatile machine operators, tractor operators, repairmen and other specialists."<sup>40</sup> In a television documentary entitled "Soldiers of the BAM", an interview was conducted with a heavy equipment operator who had obtained his skills during military service on the BAM and had decided to remain as a civilian worker after his discharge.

Utilization of railway troops on the BAM benefits the military by exercising troops in often primitive conditions that test almost all segments of their training. The military gains increasing numbers of experienced personnel in both the active and reserve forces, and it gains an improved, more secure LOC.

The Soviet government also benefits from railway troop deployment on the

BAM. The government has had to offer higher pay and other fringe benefits to attract civilian workers for a three-year period on the BAM; by using military personnel, the government gets a cheap source of labor that is constantly replenished. Civilian labor assets saved on this project are directed into other critical areas of Soviet industry.

The Soviet government recognizes both the importance of BAM and the benefits derived from use of railway troops in its construction. In the Spring of 1978, Soviet President Brezhnev toured some of the BAM construction sites; one of the first BAM workers to meet with him was PFC V.G. Balubin. The young soldier welcomed the President on behalf of all Soviet Army personnel working on the BAM and assured him that their future efforts would be accomplished by proper military dedication to country and government.<sup>41</sup>

In the concluding paragraphs of most articles describing railroad troop involvement in civil works projects like the BAM, journalists usually provide the "accepted" government position:

The soldiers, sergeants, warrant officers, and officers work with great enthusiasm. They are building a road and are simultaneously improving their military proficiency and are learning how to act as if in a combat situation - to restore and create new lines of transportation quickly and at a high rate.<sup>42</sup>

#### Military Training in Civilian Operations

Railroad troops accomplish routine train operations and have their own motive power and a large fleet of rolling stock for use in training and operational missions. Railroad troops control the movement of troop trains and sensitive cargo shipments.<sup>43</sup>

Responsibility for train operation extended, until recently, to such normally minor areas as rail spurs and spur lines that connected military installations to main rail lines. Overall responsibility for these spurs has been transferred from the Ministry of Defense to the Ministry of Railroads, but railroad troops have retained immediate control and maintenance responsibilities.<sup>44</sup>

Utilization of railroad troops in train operations provides, like their employment in civil construction projects, real operational training while augmenting the civilian labor force.

The overall training program for railroad troops appears to be effective. From the standpoint of the Ministry of Defense, real-world training for construction and operating elements improves their effectiveness. From the standpoint of the civilian sector, this low cost labor force serves to augment the civilian labor force that will face increasing shortages in the 1980s. The benefits to be gained from continuance of this system were addressed by the Chief of Railway Troops:

There is one peculiarity in the peacetime service of the railway soldiers: they improve their combat and special skills directly on the transport lines, participating actively in building the material and technical basis of communism, strengthening the economic and defense might of the Soviet state.<sup>45</sup>

### Employment

A Soviet field army (three to five divisions) normally operates from 60 to 95 miles from its own railhead, which in turn serves a number of depots within about 20 miles of the front. Each depot supports up to three divisions through a road network; trucks thus link the depots to the front. According to Soviet doctrine, as the front advances rail lines are extended and railhead and depots are relocated forward.<sup>46</sup>

The Western analyst who provided this deployment scheme has added nothing new to an evaluation provided by another analyst in the late 1960s.<sup>47</sup> Soviet logisticians have continued their silence on new techniques or improvements in this basic employment plan which is heavily influenced by World War II experiences.

One analyst has stated that the 1968 Czechoslovakian invasion was the only actual employment of this system since World War II, and the results of the Czech deployment were totally unsatisfactory.<sup>48</sup> The great improvement in the mobility of Soviet combat forces has not been matched by their rail-orientated logistics system. The Soviet combat forces simply outran their railheads.

The failure of the system in Czechoslovakia does not mean that Soviet reliance on rail transport as the backbone of their resupply system must be scrapped. It does show that improvements in motor transport must be addressed in order to eliminate the problem of supply distribution in the relatively short distances between the railhead and the combat units. Air transport assets can reduce the pressure to some extent, but improvements in motor transport utilization is the key factor.

Attention has been given to the problem of railhead mobility, but mobility comparable to that of the combat units cannot be obtained with today's rail construction technology. Modern equipment and use of new construction techniques will improve the rate of rail movement and will reduce current disparity. Railroad troop units have received more modern equipment, and their construction rates have risen accordingly:

The railway troops are now provided with equipment making possible broad mechanization of practically all the processes connected with the restoration of lines and bridges. For instance, the level of mechanization of earthwork in making embankments and excavations, laying the upper structure of the main road is now 99 per cent, that of ballasting the road 94 per cent, loading and unloading work 97 per cent. As a result the requirements in personnel for carrying out one and the same volume of work has at present been considerably reduced compared with the concluding period of the Great Patriotic War.<sup>49</sup>

### SOVIET LOGISTICS PLANNING THE ROLE OF RAILROADS IN WAR

How do Soviet military planners view the role of railroads and railroad troops in the event of war? The following excerpts from the Third Edition of Military Strategy, edited by Marshal V.D. Sokolovsky, provide some insight:

The preparation of transport for operation in wartime, accomplished in peacetime, plays an important role. In addition to the fact that transportation must, as in peacetime, ensure the operation of industry and the functioning of the entire national economy, it is entrusted with the tasks of delivering from the interior of the country to the frontal regions mobilized troops and all types of supplies for the Armed Forces.

The development of transport in peacetime is characterized on the whole by new construction and equipping of railways ... by the improvement of the technical and economic indices of all forms of operations, and by taking measures to increase its viability during enemy nuclear strikes and to ensure rapid restoration after destruction.

In the interest of preparing for war, transport facilities create, in peacetime, reserves of rolling stock and fuel for railways ... supplies of equipment for railway care ... and they prepare cadres of specialists for reconstruction work.

Railway transport occupies the most important position in the national economy.

Railway transport will, in the future, also be the main form of transport in the national economy. As has already been mentioned, in theaters of operations under present-day conditions the dominant role will be played by automobile transport, pipelines, and aircraft. However, in the interior of the country it will obviously be necessary to use all forms of transport in combination, since no one of these by itself can satisfy all the requirements of the national economy and the Armed Forces.

The role of railways in supplying the Armed Forces continues to remain very great even with the increase in the role of automotive transport, since the delivery of freight from the interior of the country to the theaters of operations will have to be accomplished mainly by rail transport.

In preparing railway transport for war it should be borne in mind that a denser railway network is always more viable, since it allows the use of all kinds of bypasses of the destroyed areas. Moreover, greater viability is achieved by creating reserves of railway carrying capacity and by taking measures to ensure the rapid reconstruction of railway lines.

Reserves of railway carrying capacity are created not only by increasing the stock of cars and locomotives (steam engines, diesel engines, electric engines), but also by the realization of other measures. Thus, for example, very great importance is attached to the acceleration of loading and unloading procedures through widespread mechanization, the introduction of containers, standardization of packages, etc., thereby reducing the idle time of railway cars and increasing their turnover. One of the means of increasing the efficiency of rail transport is to increase the weight of the trains and to increase their speed.

In order to increase viability of railways in the main directions,

especially those leading to the theaters of operations, extensive bypasses of railway junctions are usually made and tunnels are constructed.

Railways under conditions where nuclear weapons are used will obviously be subjected to destruction mainly in the regions of bridges, tunnels and other engineering work which are more difficult to reconstruct. The removal of the results of destruction will require cadres of specialists, appropriate structures for the restoration of the engineering works, and special types of cranes. Provision must also be made for the use of railways of different gauges, the preparation of extensive bypasses in contiguous territory, the equipment of transshipment regions, and the creation of a rolling stock reserve in these regions.<sup>50</sup>

These excerpts provide the reader with the opportunity to gain a sense of the type planning and thought processes used in the Soviet military establishment. In a very real sense, the Soviet government evaluates its decisions in terms of two overlying goals: the benefit of an action to its economic development; the benefit of an action to its military objectives, either in a strategic or national defense objective. The comments provided above were written within that general framework and applied specifically to the question of railroads.

#### CONCLUSIONS

In the previous sections of this paper, the author has discussed some general factors that support continued Soviet reliance on rail transport to accomplish military resupply requirements in a European conflict. The railroad troops of the Soviet Army are given the responsibility of operating, restoring, repairing and defending this capability in wartime, and a review of the history, education, mission, training and employment of the railroad troops was presented. Finally, a series of excerpts from Military Strategy was provided to give the reader a sense of how Soviet planners consider the railroads and railroad troops within the goal of utilizing peacetime to prepare for possible armed conflict at any time in the future.

In this concluding section, the following questions will be addressed:

- 1) Do Soviet railroad troops possess an effective capability in future conflict?
- 2) Will the use of rail transport play a key logistical role in a future conflict?
- 3) What changes are likely in the use of rail transport in future conflicts?

Soviet railway troops possess a highly effective capability that can transition to war footing with little difficulty because of their technical proficiency.

Their technical proficiency is high because they are involved in training almost continually. Their training ranges from purely military exercises to handling of actual movements in the rail system and construction work in civilian

projects. The many reasons behind their employment in the civil sector is not important here, but the Soviet leadership's decision to keep railroad troops occupied in civil works projects is precisely the technique required to maintain their combat readiness at high levels.

It is unlikely that any change in railroad troop utilization in the civilian sector will occur in the foreseeable future. The Soviet government is continuing to expand both its rail network and its operating fleet. In 1977 more than 1,000 kilometers of new main line entered service,<sup>51</sup> and in 1978 almost 4,000 mainline freight cars were added to the fleet.<sup>52</sup> (The largest new rail construction project in the US in 30 years was the Burlington Northern's recently completed coal line of just over 100 miles in length). The Soviet government recognizes the railroad as the backbone of its transport system, and its industry is almost totally dependent on rail transport for movement of raw materials.<sup>53</sup> Given its critical position in the Soviet economy, railroad troops will continue their involvement in civilian rail construction projects. Through the use of new equipment, new construction techniques and training of new personnel on projects like the BAM, railroad troop capabilities will certainly be maintained if not improved.

Rail transport will, of necessity, play a key role in any future conflict. The most critical requirement for rail transport capability will exist in internal Soviet cargo movement. As stated previously, the highway system within the Soviet Union, in particular outside of European Russia, is almost non-existent. Inland waterways can function only during the few months of warm weather, and their general north-south orientation does not meet the needs of a basically east and west cargo and troop flow. In a large-scale European conflict, with or without Chinese intervention, air transport will be basically used for troop movements to the combat zones and in movement of high priority cargo. Rail transport must bear the burden of the nation's internal transport requirements.

Despite the heavy internal transport responsibility, rail transport will also be utilized to move resupply stocks to units engaged in combat in Europe. The broad gauge lines into Eastern Europe will be used at maximum war density. It is a reasonable assumption that the highly rated railway construction units will be used to construct additional broad gauge spurs into Eastern Europe, at least across the border to various sites where cargo can be transferred to motor transport assets which can be fed directly into the well-developed road network.

Use of railheads to support combat units will again be utilized to the maximum extent possible. Establishment of one railhead per army will probably be unattainable within the context of a full-scale European conflict, especially in light of the problems created by increased mobility of modern combat units. The railroad troops will be required to push rail lines as far forward as possible to reduce the pressure on its less efficient motor transport assets.

To this point, nuclear weapons employment has not been considered, but it cannot be overlooked in terms of a large-scale conflict. Given the capabilities of the Soviet Army in tactical nuclear weapons and the accepted parity in strategic nuclear weapons today, nuclear conflict is no longer an absolute certainty. If nuclear strikes are employed against the Soviet Union, targeting of critical rail junctions and sites such as the wheel-changing facilities along the Soviet border with Warsaw Pact nations is a valid possibility. It can be assumed that damage to rolling stock, fixed facilities and trackage would be devastating. It can also be assumed that railway troops, like most Soviet Army units, are capable of continued operations on a nuclear battlefield. Railway troops receive training under nuclear combat

conditions. Their construction requirements and plans take nuclear destruction into account, and a great assortment of equipment, especially motive power, is stockpiled in the interior of the Soviet Union.<sup>54</sup> Nuclear combat and its destructive effects have yet to be experienced, but if acknowledgement of such a possibility can produce positive results in the event of nuclear strikes, the railroad troops and rail transport system appear to be as prepared as any logistics unit can be.

In the foreseeable future, rail transport functions within the overall military logistics system of the Soviet Army are unlikely to be changed. Lack of change is certainly true regarding requirements for internal rail transport. In external operations, i.e. in the rear areas of European combat zones, rail transport will not be subject to any operational or functional change. What is likely to be changed is the conceptual reliance on rail transport to provide the direct or almost direct resupply of combat forces. Continued Soviet improvements in its employment of motor transport assets, and the entry into the inventory of improved cargo vehicles capable of increased tonnages in large numbers to service the forward logistical areas (between the railheads and combat units' rear) will create a system much like that used in most Western armies. Rail transport will be utilized to move large quantities of material, in particular tanks, armored vehicles, large items of equipment, ammunition and rations to depot sites as far forward as possible. From these depots, motor transport assets will deliver the supplies to a series of smaller tactical unit depots or directly to the combat units. In the case of tanks and other fighting vehicles, personnel could drive them away from the depots for direct delivery to the using units. As the combat areas move forward, the railheads will also move, but motor transport will continue to provide the connecting link.

Until recent years, the Soviets lacked the reliable motor transport assets to accomplish their mission. As stated previously in this paper, the Soviets are aware of their motor transport problems and are taking action to correct them. When the motor transport problems are solved, the conceptual change in the function of rail transport will evolve naturally. The railroads will continue to retain their importance, but as a general resupply mode, not a system for directly resupplying combat units in the forward battle zones.

Large modern armies consume ammunition and fuel at rates far in excess of World War II figures. These modern armies operating in a nuclear environment will require equipment replacement at rates far higher than in previous conflicts. Under these conditions, the only land mode of transportation that can possibly move the thousands of tons of supplies needed, especially replacement tanks and stocks of ammunition and fuel is rail transport. In the modern combat arena, the role of rail transport will become more important to the Soviets. At present, the Soviet Army possesses the best rail transport capability in terms of trained personnel and numbers of rail assets in Europe, and probably in the world.

FOOTNOTES

<sup>1</sup> Based upon the fact that almost all Soviet naval combat vessels have helicopter landing pads, while many of the newer vessels have their own helicopter assets.

<sup>2</sup> G. Turberville, "Soviet Logistics Support for Ground Operations", RUSI, September 1975, p.63.

<sup>3</sup> Jeffrey Record, Sizing Up The Soviet Army, (Washington, D.C.: The Brookings Institute, 1978), p.47.

<sup>4</sup> Harriet Fast Scott and William F. Scott, The Armed Forces Of The USSR, (Boulder, Colorado: Westview Press, 1979), pp.227-228.

<sup>5</sup> Paul E. Lydolph, Geography of the USSR. (Elkhart Lake, Wisconsin: Misty Valley Publishing, 1979), p.444.

<sup>6</sup> Ibid., p.420.

<sup>7</sup> Ibid., p.422.

<sup>8</sup> Ibid. The author stated that on the most highly traveled line, the Trans-Siberian, he observed during the summer of 1977 that train frequencies during peak traffic periods were as little as 3 minutes.

<sup>9</sup> Record, p.21.

<sup>10</sup> James R. Sullivan, Notes On USSR Railways And The Trans-Siberian Route, (Philadelphia: Penn Central Transportation Co., 1975), p.5.

<sup>11</sup> V.A. Shanina, Transportno-ekonomicheskiye svyazi stran-chlenov SEV, (Moskva: Nauka, 1978), p.140.

<sup>12</sup> Turberville, p.65.

<sup>13</sup> Lydolph, p.445.

<sup>14</sup> Turberville, p.67.

<sup>15</sup> Sovetskaya Voyennaya Entsiklopediya, Vol. 3, 1977 ed., "Zhelenorozhny Voyska", p.321.

<sup>16</sup> N. Kharitonov, "Armored Train No. 50-67", Soviet Military Review, No. 2, February 1979, p.2.

<sup>17</sup> Ibid.

<sup>18</sup> A. Kryukov, "The Soviet Railway Troops", Soviet Military Review, No. 8, August 1974, p.2.

<sup>19</sup> Holland Hunter, Soviet Transport Experience, (Washington D.C.: The Brookings Institute, 1968), p.60.

<sup>20</sup> A. Kryukov, "Railway Soldiers", Soviet Military Review, No. 7, July 1979, p.12.

<sup>21</sup> Yu. Kazmin, et al., "Dlinnyye kilometry", Pravda, 14 July 1977, p.2.

<sup>22</sup> Scott and Scott, p.347.

<sup>23</sup> Ibid.

<sup>24</sup> "Ob'yavlyayut priyem na pervyy kurs voyennyye uchilishcha: Tyla", Krasnaya Zvezda, 10 March 1977, p.4.

<sup>25</sup> L.N. Buffardi, Zheleznodorozhni - The Soviet Railroad Troops, (Garmisch: United States Army Russian Institute, March 1978), p.15.

<sup>26</sup> Scott and Scott, p.347.

<sup>27</sup> In the Soviet Union the title of "Engineer" is a much more broad and general term than it is in the U.S. In the Soviet Union, an engineer can be anyone from a boiler operator to an electrical engineer.

<sup>28</sup> Krasnaya Zvezda, 10 March 1977, p.4.

<sup>29</sup> Kryukov, "Railway Soldiers", p.14.

<sup>30</sup> Kryukov, "The Soviet Railway Troops", p.2.

<sup>31</sup> Kryukov, "Railway Soldiers", p.11.

<sup>32</sup> Turbiville, p.68.

<sup>33</sup> Crew drill was shown on the Moscow television program, "Soldat BAMa", where soldiers took weapons from racks on the train and some stacked near their work sites and maneuvered against an "aggressor" force. A captioned photograph in Kryukov, "The Soviet Railway Troops", shows a rail crew responding to an alert alarm.

<sup>34</sup> Kryukov, "The Soviet Railway Troops", p.4.

<sup>35</sup> G. Bocharov, "The Baikal-Amur Railway - A Youth Project", Soviet Military Review, No. 5, May 1977, p.6.

<sup>36</sup> David K. Willis, "Stitching new rails across Siberia", The Christian Science Monitor, 23 February 1978, p.3.

<sup>37</sup> M. Kuznetsov, "Sleduya slavnym traditsiyam", Tyl i Snabzheniye, No. 3, 1978, p.52.

<sup>38</sup> Henry Einstein, Lecture presented at the United States Army Russian Institute, 6 December 1979.

<sup>39</sup> S. Troyan, "Baikal-Amur Railroad, A Road of Courage", Soviet Military Review, No. 1, January 1975, p.18.

<sup>40</sup> Ibid.

<sup>41</sup> "Vstrecha tovarishcha L.I. Brezhneva so stroitelyami BAMa", Pravda, 5 April 1978, p.1.

<sup>42</sup> M. Chizhnikov, "Voiny-zheleznodorozhni shturmuyut vekovuyu taygu", Tyl i Snabzheniye, No. 8, 1975, p.87.

43 Buffardi, p.4.

44 A. Chekmarov, "Soderzhaniye i obsluzhivaniye zheleznodorozhnykh pod'yezdnykh putey", Tyl i Snabzheniye, No. 8, 1975, p.76.

45 Kryukov, "Railway Soldiers", p.13.

46 Record, p.45.

47 Leo Heiman, "Soviet Invasion Weaknesses", Military Review, No. 8, August 1969, p.42.

48 Ibid.

49 Kryukov, "Railway Soldiers", p.13.

50 V. Sokolovsky, Voyennaya Strategiya, trans. Harriet F. Scott (Palo Alto: Stanford Research Institute, 1971), pp.372-374.

51 "Country On The Staircase Of The Five-Year Plan", Pravda, 28 January 1978, pp.1-2 as translated in The Current Digest Of The Soviet Press, Vol. XXX, No. 4, p.13.

52 "Up the Steps Of The Five-Year Plan", Pravda, 20 January 1979, pp.1-2 as translated in The Current Digest Of The Soviet Press, Vol. XXXI, No. 3, p.14.

53 Lydolph, p.427.

54 Sullivan, p.5.

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